

**Disclaimer:**

This English translation is produced by machine translation and may contain errors. The JPO, the INPIT, and those who drafted this document in the original language are not responsible for the result of the translation.

**Notes:**

1. Untranslatable words are replaced with asterisks (\* \*\*).
2. Texts in the figures are not translated and shown as it is.

Translated: 05:36:53 JST 07/09/2009

Dictionary Last updated 06/08/2009 / Priority:

**[Document Name]Description**

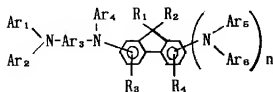
**[Title of the Invention]**A process cartridge and an electrophotography device which have an electro photography photo conductor and this electro photography photo conductor

**[Claim(s)]**

**[Claim 1]**An electro photography photo conductor, wherein this photosensitive layer contains a TORUA reel amine compound shown by the following general formula (1) in an electro photography photo conductor which has a photosensitive layer on a conductive base material.

A general formula (1)

**[Chemical formula 1]**



Ar<sub>1</sub> - Ar<sub>6</sub> express among a formula a heterocyclic machine which may have an aromatic ring machine or a substituent which may have a substituent, respectively, and, [ R<sub>1</sub> - R<sub>4</sub> ]

Expressing a hydrogen atom, an alkyl group which may have a substituent, an aralkyl group which may have a substituent, or an aryl group which may have a substituent, respectively, n

expresses an integer of 0 or 1.

[Claim 2]A process cartridge being able to support to one at least one means chosen from a group which consists of the electro photography photo conductor according to claim 1 and an electrifying means, a developing means, and a cleaning means, and being able to detach and attach freely on a main part of an electrophotography device.

[Claim 3]An electrophotography device having the electro photography photo conductor according to claim 1, an electrifying means, an image exposure means, a developing means, and a transfer means.

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to a process cartridge and an electrophotography device provided with the electro photography photo conductor and this electro photography photo conductor.

[0002]

[Description of the Prior Art]If it opens with an electro photography photo conductor conventionally, the having-photosensitive layer which makes selenium, cadmium sulfide, zinc oxide, etc. the main ingredients inorganic matter photo conductor has been used widely. There are problems, like although it has a certain amount of [ this ] cardinal trait, its manufacturing cost is high [ with bad reversibility ] with difficult membrane formation. The inorganic light conductive material generally had strong toxicity, it was dealt with in the manufacture top row, and, also upwards, big restrictions were.

[0003]On the other hand, it has many advantages compensated with the above-mentioned fault of an inorganic photo conductor, much proposals are made until now, and the organic photoreceptor which makes an organic light conductivity compound the main ingredients has been put in practical use. Since the used electro photography photo conductor has the good membrane formation nature of an organic light conductivity substance and it can produce it by a coating, productivity is very high and it has an advantage which can provide an inexpensive electro photography photo conductor. The electro photography photo conductor which makes a subject the charge transfer complex formed as such an organic photoreceptor from the optical conductive polymer etc. which are represented by poly-N-vinylcarbazole, and Lewis acid, such as a 2, 4, and 7-trinitro 9-fluorenone, is proposed. Although these organic light conductive polymers are excellent in respect of lightweight nature and membrane formation nature etc. compared with the inorganic light conductive polymer, they are inferior compared with the inorganic light conductive material in respect of sensitivity, endurance, the stability by an environmental variation, etc. It cannot necessarily be satisfied.

[0004]On the other hand, the functional discrete type electro photography photo conductor which made the electric charge generating function and the electric charge transportation function share with a respectively separate substance brought about the improvement remarkable in the sensitivity and endurance which were made into the fault of the conventional organic photoreceptor. It has the advantage that each material selection range of an electric charge generating substance and an electric charge transportation substance of such a functional discrete type photo conductor is wide, and the electro photography photo conductor which has the arbitrary characteristics can be created comparatively easily.

[0005]As an electric charge generating substance, an azo pigment, polycyclic quinone paints, a cyanine pigment, SUKUEARIKU acid dye, pyrylium salt dye, etc. are known. Much structure is advocated for the material composition with large electric charge developmental potency power in which lightfastness of an azo pigment is strong, from a point of easy \*\* also in it.

[0006]On the other hand, as an electric charge transportation substance, they are a JP,S52-4188,B written PIRAZORIN compound, JP,S55-42880,B, and JP,S55-52063,A, for example. The stilbene compound the hydrazone compound of a description, JP,H3-261985,A, JP,S61-

132955,A and a bird phenylamine compound given in JP,2-190862,A, JP,S54-151955,A, and given in JP,S58-198043,A etc. are known.

[0007] It is stable to (1) light and heat to be required of these electric charge transportation substances, (2) It is mentioned to the ozone by corona discharge to generate,  $\text{NO}_x$ , nitric acid, etc. that compatibility with a stable thing, having high electric charge transportation ability and (3) (4) organic solvent, and a binder is high, that (5) manufactures are easy and inexpensive, etc. [ by providing a protection layer on a photosensitive layer for the improvement in endurance, or saving a photo conductor with a copying machine, a laser beam printer, etc. with the further raise in durability in recent years, over a long period of time etc. ] A crack may arise in an electric charge transportation layer, or crystallization and the phenomenon of carrying out phase separation may arise, and an electric charge transportation substance may become a picture defect. In the reversal development system corresponding to digitization in recent years, since primary electrification and transfer electrification are reverse polarity, what is called a transfer memory from which electrostatic property differs by the existence of transfer arises, and it is very easy to appear as picture top concentration unevenness.

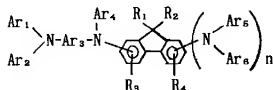
[0008]

[Problem to be solved by the invention]. The purpose of this invention has big sensitivity and moreover stable maintenance of the potential at the time of use can be performed repeatedly. Provide a protection layer on a photosensitive layer, or even if it saves a photo conductor with a copying machine, a laser beam printer, etc. over a long period of time, a crack arises in an electric charge transportation layer, or, Providing the electro photography photo conductor which a transfer memory does not produce easily, and manufacture are easy also for the reversal development system which crystallization of an electric charge transportation substance, etc. do not produce, And it is providing the process cartridge and electrophotography device using providing the new organic light conductivity compound which can be provided inexpensive, and this electro photography photo conductor.

[0009]

[Means for solving problem]the doria this photosensitive layer is indicated to be by the following general formula (1) in the electro photography photo conductor in which this invention has a photosensitive layer on a conductive base material -- it comprises an electro photography photo conductor containing a reel amine compound. General formula (1)

[Chemical formula 2]



$Ar_1 - Ar_6$  express among a formula the heterocyclic machine which may have the aromatic ring machine or substituent which may have a substituent, respectively, and,  $[R_1 - R_4]$  Expressing a hydrogen atom, the alkyl group which may have a substituent, the aralkyl group which may have a substituent, or the aryl group which may have a substituent, respectively,  $n$  expresses the integer of 0 or 1.

[0010]This invention supports to one at least one means chosen from the group which consists of the electro photography photo conductor of said this invention and an electrifying means, a developing means, and a cleaning means, and comprises a process cartridge being able to detach and attach freely on the main part of an electrophotography device.

[0011]This invention comprises an electrophotography device having the electro photography photo conductor, the electrifying means, the image exposure means, developing means, and transfer means of said this invention.

[0012]

[Mode for carrying out the invention]As an aromatic ring machine with which  $Ar_1 - Ar_6$  express among a general formula (1), a phenyl, [Naff Chill etc. ] [ as an alkyl group which pyridyl,

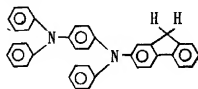
quinolyl, etc. are mentioned as a heterocyclic machine and  $R_1 - R_4$  express ] As an aralkyl group, methyl, ethyl, propyl, etc. Ben Jill, FENECHIRU, etc., [ as a substituent which bases, such as a phenyl and Naff Chill, are mentioned as an aryl group, and bases, such as this, may have ] Halogen atoms, such as aryl groups, such as aralkyl groups, such as alkyl groups, such as methyl, ethyl, and propyl, Ben Jill, and FENECHIRU, a phenyl, and Naff Chill, a fluorine atom, and a chlorine atom, a hydroxyl group, etc. are mentioned.

[0013]The example of representation is hung up over Tables 1-8 about the compound shown by a general formula (1) below, however it is not limited to compounds, such as this.

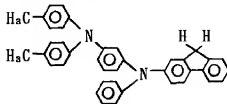
[0014]

[Table 1]

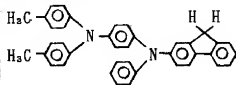
例示化合物 1



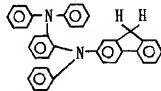
例示化合物 2



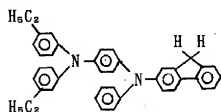
例示化合物 3



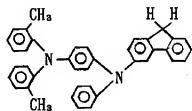
例示化合物 4



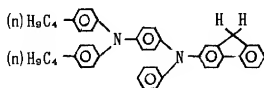
例示化合物 5



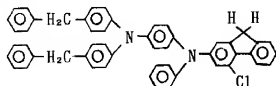
例示化合物 6



例示化合物 7

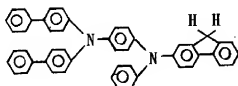


例示化合物 8

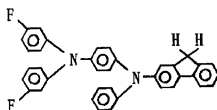


[Table 2]

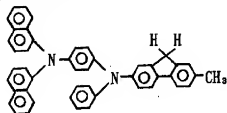
例示化合物 9



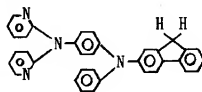
例示化合物 10



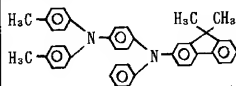
例示化合物 11



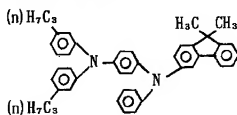
例示化合物 12



例示化合物 13

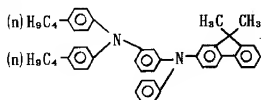


例示化合物 14

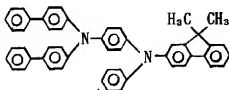


[Table 3]

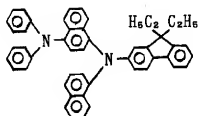
例示化合物 1 5



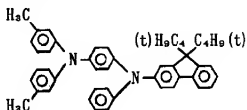
例示化合物 1 6



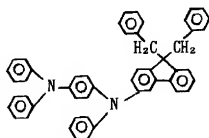
例示化合物 1 7



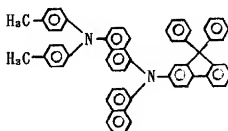
例示化合物 1 8



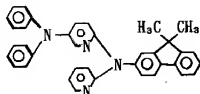
例示化合物 1 9



例示化合物 2 0

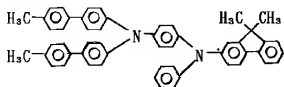


例示化合物 2 1

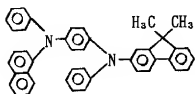


[Table 4]

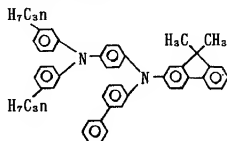
例示化合物 2 2



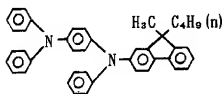
例示化合物 2 3



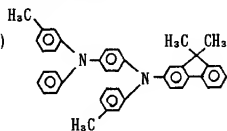
例示化合物 2 4



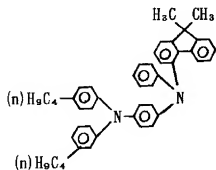
例示化合物 2 5



例示化合物 2 6

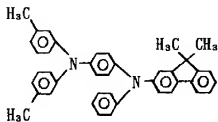


例示化合物 2 7

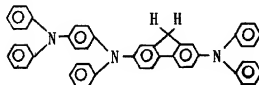


[Table 5]

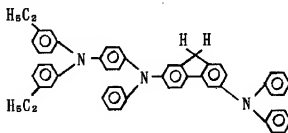
例示化合物 2 8



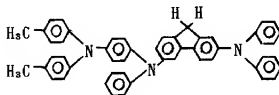
例示化合物 2 9



例示化合物 3 0

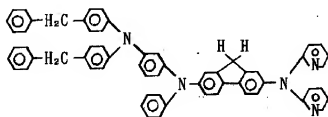


例示化合物 3 1

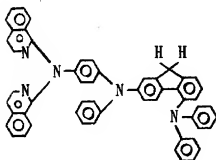


[Table 6]

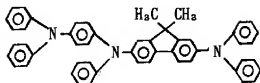
例示化合物 3 2



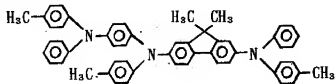
例示化合物 3 3



例示化合物 3 4

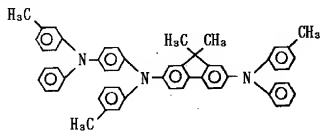


例示化合物 3 5

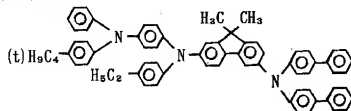


[Table 7]

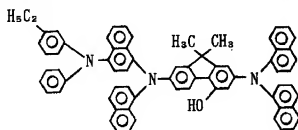
例示化合物 3 6



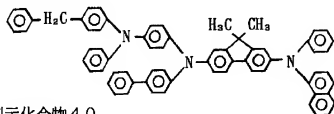
例示化合物 3 7



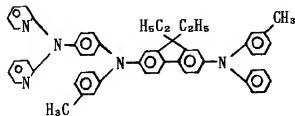
例示化合物 3 8



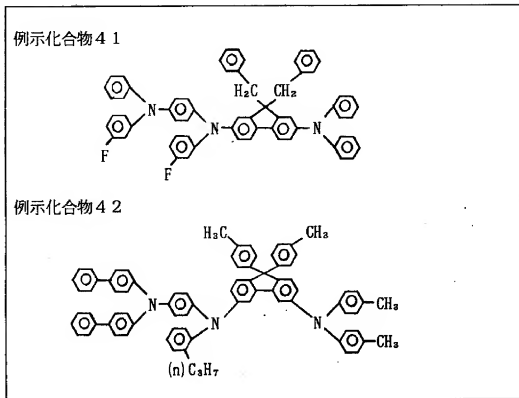
例示化合物 3 9



例示化合物 4 0

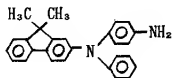


[Table 8]



[0015]The synthetic example (composition of illustration compound 5) following compound 10g (0.0305 mol),

[Chemical formula 3]



17.5 g (0.0762 mol) of Para \*\*\* toluene, the potassium carbonate 16.8g (0.122 mol), and 10.1 g (0.1525 mol) of copper powder were added to 100 ml of dichlorobenzene, and heating-under churning flowing back was performed for 6 hours. After radiational cooling, suction filtration was carried out and the solvent was removed from \*\*\*\* under decompression. Separation refining of the residue was carried out with the silica gel column, and the purpose compound

12.8g and 80% of \*\*\*\* were obtained.

[0016]Other compounds are compounded by the same technique.

[0017]the doria the electro photography photo conductor of this invention is indicated to be by a general formula (1) -- it is constituted combining the electric charge transportation substance which consists of a reel amine compound, and a suitable electric charge generating substance. The form shown below, for example is mentioned as composition of a photosensitive layer. (1) The layer containing the layer (3) electric-charge generating substance containing the layer / electric charge generating substance containing the layer (2) electric-charge transportation substance containing the layer / electric charge transportation substance containing an electric charge generating substance, the layer / electric charge generating substance containing the layer (4) electric-charge generating substance containing an electric charge transportation substance, and an electric charge transportation substance

[0018]the doria the electro photography photo conductor of this invention is indicated to be by a general formula (1) -- since a reel amine compound all has high transportation ability to an electron hole, it can be used as an electric charge transportation substance in the photosensitive layer of the above-mentioned form. When the form of a photosensitive layer is (1), negative electrification and in the case of (2), right electrification is preferred, and when it is (3) and (4), it can use [ either positive or negative ]. In the electro photography photo conductor of this invention, a protection layer and an insulating layer may be provided on the surface of a photosensitive layer for adhesive improvement or electric charge pouring restrictions. The composition of this invention is not limited to the above-mentioned basic composition. Among the above-mentioned basic composition, especially, following the form of (1) is preferred, it explains in detail.

[0019]As a conductive base material in this invention, the thing of the following form can be mentioned, for example. (1) What made metal, such as aluminum, an aluminium alloy, stainless steel, and copper, board shape or drum shape. (2) What carried out thin film formation by vapor-depositing or laminating metal, such as aluminum, palladium, rhodium, gold, and platinum, on non-conducting base materials, such as glass, resin, and paper, or the conductive base material of the above (1). (3) What was formed by vapor-depositing or

applying the layer of conductive compounds, such as a conductive polymer, tin oxide, and indium oxide, on non-conducting base materials, such as glass, resin, and paper, or the conductive base material of the above (1).

[0020]As an electric charge generating substance used in this invention, the following substances are mentioned, for example. Electric charge generating substances, such as this, may be used independently, and may be combined two or more kinds. (1) Azo pigment (2) indigo, such as monoazo, screw azo, and tris azo, Phthalocyanine pigment (4) PERIREN acid anhydrides, such as indigo system paints (3) metal phthalocyanines, such as CHIOINJIGO, and nonmetallic phthalocyanine, Inorganic matters, such as polycyclic quinone system paints (6) SUKUWARIRIUMU pigment (7) pyrylium salt, such as PERIREN system paints (5) anthraquinone, such as PERIREN acid imide, and pyrene INON, CHIOPIRIRIUMU salts (8) triphenylmethane dye (9) selenium, and amorphous silicon

[0021]A charge generating layer can be formed by distributing the above electric charge generating substances to a suitable binder, and coating this on a conductive base material. It can form also by forming a thin film with dry methods, such as vapor deposition, weld slag, and CVD, on a conductive base material.

[0022]Can choose from wide range bending resin as the above-mentioned binder, and For example, polycarbonate, Polyester, poly arylate, butyral resin, polystyrene, polyvinyl acetal, Although diallyl phthalate resin, an acrylic resin, methacrylic resin, acetic acid polyvinyl resin, phenol resin, silicon resin, polysulfone, a styrene butadiene copolymer, alkyd resin, an epoxy resin, urea resin, a VCM/PVC acetic acid vinyl copolymer, etc. are mentioned, It is not limited to these resin. as that these resin is independent or copolymer polymer -- one sort -- or two or more sorts may be mixed and it may use.

[0023]The resin contained in a charge generating layer is 40 or less weight % preferably 80 or less weight %. As for especially the film thickness of a charge generating layer, it is preferred to consider it as a 0.01-2-micrometer thin film layer 5 micrometers or less. a charge generating layer -- the increase of versatility -- admiration -- an agent -- it may add.

[0024]the doria an electric charge transportation layer is indicated to be by said general formula (1) at least -- it can form combining a reel amine compound and a suitable binder (bending resin). As a binder used for an electric charge transportation layer here, the binder used for said charge generating layer is mentioned, and also optical conductive polymer compounds, such as polyvinyl carbazole and polyvinyl anthracene, are mentioned.

[0025]the doria shown by this binder and general formula (1) -- the combination rate with a reel amine compound -- per binder 100 weight section and doria -- it is preferred to make a reel amine compound into 10 - 500 weight section. It is electrically connected with the charge generating layer, and an electric charge transportation layer has a function in which these electric charge carriers can be conveyed to the surface while receiving the electric charge carrier poured in from the charge generating layer under existence of an electric field. Since this electric charge transportation layer has the limit that an electric charge carrier can be conveyed, film thickness cannot be thickened more than needed, but the range of 10-30 micrometers is especially preferred 5-40 micrometers.

[0026]An antioxidant, an ultraviolet ray absorbent, a plasticizer, or a publicly known electric charge transportation substance can also be added if needed in an electric charge transportation layer.

[0027]When forming such an electric charge transportation layer, it can carry out using coating methods, such as an immersion coating method, a spray coating method, a spinner coating method, a roller coating method, the \*\*\*\*\*-\*\*\_\*\*\_\*\*\*\*\* method, and a blade coating method, using a suitable organic solvent.

[0028]Next, the process cartridge and electrophotography device of this invention are explained. The outline composition of the electrophotography device which has a process cartridge which has an electro photography photo conductor of this invention is shown in drawing 1. In a figure, 1 is an electro photography photo conductor of drum-like this invention, and is rotated with predetermined peripheral velocity in the direction of an arrow centering on the axis 2. In a rotation process, the photo conductor 1 receives uniform electrification of positive or negative predetermined potential in the peripheral surface by the primary electrifying means 3, ranks second and receives the picture exposure light 4 from image

exposure means (un-illustrating), such as slit exposure and laser beam scanning exposure. In this way, the electrostatic latent image is formed in the peripheral surface of the photo conductor 1 one by one.

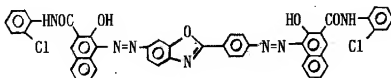
[0029]Subsequently toner development of the formed electrostatic latent image is carried out by the developing means 5, and the developed toner development image is transferred one by one by the transfer means 6 by the transfer material 7 which synchronization-picked with rotation of the photo conductor 1 and with which it was fed between the photo conductor 1 and the transfer means 6 from the unillustrated feeding part. The transfer material 7 which received image transfer is printed out out of a device as a copy (copy) by dissociating from a photo conductor side, being introduced to the image fixing means 8, and receiving image fixing. The surface of the photo conductor 1 after image transfer is used for repetition image formation, after a pure side is formed by the cleaning means 9 in response to removal of the transfer remaining toner and also electric discharge processing is carried out by the pre-exposure light 10 from a pre exposure means (un-illustrating). When the primary electrifying means 3 is a contact electrifying means using an electrification roller etc., pre-exposure is not necessarily required.

[0030]In this invention, the inside of the component of the above-mentioned photo conductor 1, the primary electrifying means 3, the developing means 5, and cleaning means 9 grade, By using two or more things as a process cartridge, it may combine with one, and may constitute, and this process cartridge may be constituted removable to main parts of an electrophotography device, such as a copying machine and a laser beam printer. For example, in support of at least one of the primary electrifying means 3, the developing means 5, and the cleaning means 9, it can cartridge-ize to one with the photo conductor 1, and can be made the main part of a device with the removable process cartridge 11 using the guide mechanism of the rail 12 grade of the main part of a device. . When electrophotography devices are a copying machine and a printer, the reflected light and penetration light from a manuscript are used for the picture exposure light 4. Or it is the light irradiated by the scan of a laser beam which reads and carries out conversion to signals of the manuscript by a sensor, and is performed according to this signal, the drive of a LED array, the drive of a liquid crystal shutter array, etc.

[0031]

[Working example]The screw azo pigment 2.9g which has the embodiment 1 following structural formula

[Chemical formula 4]



It distributed by SANDOMIRU for 40 hours with the liquid which dissolved 3.1 g of butyral resin (degree % of 68 mol of butyral-izing) in 85 ml of cyclohexanone, and coating liquid was prepared. It applied by Mai Ya Bar so that the film thickness after drying this coating liquid on an aluminum sheet might be set to 0.18 micrometer, and the charge generating layer was formed.

[0032]Next, 9.5 g and 9 g of polycarbonate resin (weight average molecular weights 33 and 000) are dissolved for said illustration compound 1 in 72 g of mono-chlorobenzene as an electric charge transportation substance (electric charge transportation compound), This liquid was applied by Mai Ya Bar on the previous charge generating layer, and the film thickness after dryness formed the electric charge transportation layer which is 20 micrometers, and created the electro photography photo conductor.

[0033]After carrying out corona electrical charging of the created electro photography photo conductor by -5kV by the SUTACHIKKU method using product [ made from Kawaguchi Electrical machinery ] electrostatic copying paper test equipment Model-SP-428 and holding for 1 second in a dark place, it exposed by illumination 20Lux and the electrification characteristic was investigated.

[0034]The light exposure ( $E_{1/5}$ ) required to decrease potential ( $V_1$ ) when carrying out dark attenuation for 1 second with surface potential ( $V_0$ ) to one fifth as the electrification characteristic was measured.

[0035] the photo conductor created by this example in order to measure change of bright section potential when it is used repeatedly, and dark part potential ] It stuck on the photo conductor drum Mr. cylinder of Canon, Inc. make PPC copying machine NP-3825, a 3,000-sheet copy was performed by the opportunity, and change part  $V_L$  of the bright section potential ( $V_L$ ) after the first stage and a 3,000-sheet copy and change part  $V_D$  of dark part potential ( $V_D$ ) were measured. Early  $V_D$  and  $V_L$  were set up, respectively so that it might be set to -700V and -200V.

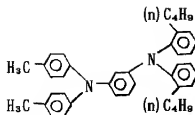
[0036]\*\*\*\* was made to adhere to the surface of the electro photography photo conductor created as mentioned above as a promotion examination of the crack of a photosensitive layer, it was neglected under normal temperature normal pressure for 8 hours, and it was observed whether the crack would have arisen in the photosensitive layer.

[0037]\*\*\*\* was made to adhere to the surface of the electro photography photo conductor created as mentioned above as a promotion examination of crystallization of an electric charge transportation substance, it was neglected for one week at 75 \*\*, and it was observed whether crystallization of the electric charge transportation substance would have arisen.

[0038]Embodiments 2-8 and the comparative examples 1-3 -- in this embodiment and comparative example, It replaced with the electric charge transportation compound of the illustration compound 1 used in Embodiment 1, and in the embodiment, the compound shown in the after-mentioned table 1 and the compound shown below in a comparative example were used, and also the electro photography photo conductor was created by the same method as Embodiment 1. And the same method as Embodiment 1 estimated evaluation of crystallization of the electrophotographic properties of each electro photography photo conductor, the crack of a photosensitive layer, and an electric charge transportation substance.

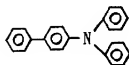
[0039]The compound A used by the comparative example 1

[Chemical formula 5]



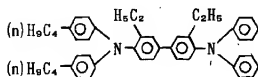
The compound B used by the comparative example 2

[Chemical formula 6]



The compound C used by the comparative example 3

[Chemical formula 7]



[0040]The evaluation result of Embodiments 1-8 is shown in Tables 9 and 10, and the evaluation result of the comparative examples 1-3 is shown in Tables 11 and 12.

[Table 9]

	例示化合物	初期特性			3000枚後の 電位変動	
		$V_0$ (-V)	$V_1$ (-V)	$E_{1/5}$ (lux·sec)	$\Delta V_a$ (V)	$\Delta V_1$ (V)
実施例 1	1	705	700	1.6	-10	-5
実施例 2	7	700	690	1.5	-10	+10
実施例 3	13	695	690	1.5	-5	+10
実施例 4	19	690	685	1.6	-10	+10
実施例 5	32	705	700	1.4	$\pm 0$	+5
実施例 6	36	705	705	1.3	$\pm 0$	$\pm 0$
実施例 7	40	700	700	1.4	-5	+5
実施例 8	42	690	685	1.4	-5	+10

[Table 10]

	例示化合物	感光層のクラック				電荷輸送物質の結晶化			
		1 H	2 H	4 H	8 H	1 日	3 日	5 日	7 日
実施例 1	1	○	○	○	○	○	○	○	○
実施例 2	7	○	○	○	○	○	○	○	○
実施例 3	13	○	○	○	○	○	○	○	○
実施例 4	19	○	○	○	○	○	○	○	○
実施例 5	32	○	○	○	○	○	○	○	○
実施例 6	36	○	○	○	○	○	○	○	○
実施例 7	40	○	○	○	○	○	○	○	○
実施例 8	42	○	○	○	○	○	○	○	○

○：クラックなし、結晶化なし    ×：クラックあり、結晶化あり

[Table 11]

	例示化合物	初期特性			3000枚後の電位変動	
		V <sub>0</sub> (-V)	V <sub>1</sub> (-V)	E <sub>1/6</sub> (lux・sec)	ΔV <sub>d</sub> (V)	ΔV <sub>1</sub> (V)
比較例 1	A	700	670	1.5	-20	+30
比較例 2	B	700	675	1.6	-25	+20
比較例 3	C	680	660	1.6	-30	+15

[Table 12]

	例示 化合物	感光層のクラック				電荷輸送物質の結晶化			
		1 H	2 H	4 H	8 H	1 日	3 日	5 日	7 日
比較例 1	A	○	×	—	—	○	○	○	×
比較例 2	B	○	○	×	—	○	○	×	—
比較例 3	C	○	○	×	—	○	×	—	—

○ : クラックなし、結晶化なし    × : クラックあり、結晶化あり

Table 9 - 12 shows crystallization of the crack of a photosensitive layer and an electric charge transportation substance not producing the embodiment of this invention compared with a comparative example, but excelling extremely.

[0041]On an embodiment 9 aluminum base material, the liquid which dissolved 5.0 g of N-methoxymethyl-ized 6 nylon resin (weight average molecular weight 29,000) and 13 g of alcoholic soluble copolymerization nylon resin (weight average molecular weight 32,000) in the methanol 95g is applied by Mai Ya Bar, The film thickness after dryness formed the lower influence layer which is 1.2 micrometers.

[0042]Next, 10 g of OKISHI titanylphthalocyanine, and 5.3 g of polyvinyl butyral resin (72% of the rate of butyral-izing, the weight average molecular weight 33,000) and the dioxane 90g were distributed by the ball mill for 20 hours. The film thickness after an application according these dispersion liquid to blade coating and dryness formed the charge generating layer which is 0.18 micrometer on the lower influence layer.

[0043]Next, 9 g of the illustration compound 9 and 8.5 g of polycarbonate Z type resin (weight average molecular weight 32,000) are dissolved in 72 g of mono-chlorobenzene, The film thickness after an application according this liquid to blade coating to a charge generating

layer top and dryness formed the electric charge transportation layer which is 22 micrometers, and created the electro photography photo conductor.

[0044]-5kV corona discharge was performed to the created electro photography photo conductor. The surface potential at this time (initial potential  $V_0$ ) was measured. The surface potential after neglecting this photo conductor for 1 second in a dark place was measured. Sensitivity was evaluated by measuring a light exposure ( $E_{1/6}$ :  $\mu\text{J}/\text{cm}^2$ ) required to decrease potential  $V_1$  after carrying out dark attenuation to one sixth. Under the present circumstances, the ternary system semiconductor laser (output: 5 mW : dispatch wavelength of 780 nm) of gallium / aluminum / arsenic was used as a light source.

[0045]Next, the above-mentioned photo conductor is attached to the laser beam printer (modified machine of LBP= SX by Canon, Inc.) which is an electro photography method printer of the reversal development method provided with the semiconductor laser same as the above,  $V_{d1}$  and primary electrification voltage at the time of the transfer current ON were made into  $V_{d2}$  for the primary electrification voltage at the time of the transfer current OFF, what is called a transfer memory ( $V_{d1}-V_{d2}$ ) was measured, and the image formation test was done. The conditions are as follows. Surface potential after primary electrification : -700V, surface potential:-150V after image exposure (light exposure  $1.0\mu\text{J}/\text{cm}^2$ ), Transfer potential : +700V, development polarity:cathode nature, process speed:47mm/sec, Development conditions (development bias) : although -450V, an after [ image exposure ] scanning method:image scan, red complete exposure of front [ primary electrification ] exposure:8.0 Lux-sec, and image formation carried out line-scan [ of the laser beam ] according to the character signal and the picture signal and were performed, The print with good character and picture was obtained.

[0046]The same method as Embodiment 1 estimated evaluation of crystallization of the crack of a photosensitive layer of the electro photography photo conductor created like the above, and an electric charge transportation substance. A result is shown in Tables 13 and 14.

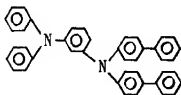
[0047]Used the compound which is replaced with the illustration compound 5 used in ten to

embodiment 14 Embodiment 9, and is shown in the after-mentioned table 13, and also. The electro photography photo conductor was created like Embodiment 9, and the same method as Embodiment 9 estimated evaluation of crystallization of the crack of the electrophotographic properties of each electro photography photo conductor, a transfer memory, and a photosensitive layer, and an electric charge transportation substance. A result is shown in Tables 13 and 14.

[0048]It replaced with the illustration compound 5 used in four to comparative example 6 Embodiment 9, and the compound shown below was used and also the electro photography photo conductor was created by the same method as Embodiment 9. And the same method as Embodiment 9 estimated evaluation of crystallization of the crack of the electrophotographic properties of each electro photography photo conductor, a transfer memory, and a photosensitive layer, and an electric charge transportation substance. A result is shown in Tables 15 and 16.

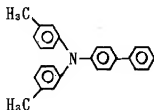
[0049]The compound D used by the comparative example 4

[Chemical formula 8]



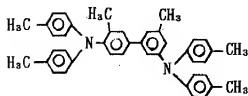
The compound E used by the comparative example 5

[Chemical formula 9]



The compound F used by the comparative example 6

[Chemical formula 10]



[0050]

[Table 13]

	例示化合物	初期特性			転写メモリ $V_{a1} - V_{a2}$ (V)
		$V_0$ (-V)	$V_i$ (-V)	$E_{1/5}$ (lux·sec)	
実施例9	9	690	690	1.0	20
実施例10	18	695	690	0.85	18
実施例11	26	705	700	0.84	10
実施例12	31	700	690	0.77	9
実施例13	35	705	700	0.68	5
実施例14	39	700	690	0.70	14

[Table 14]

	例示化合物	感光層のクラック				電荷輸送物質の結晶化			
		1 H	2 H	4 H	8 H	1日	3日	5日	7日
実施例9	9	○	○	○	○	○	○	○	○
実施例10	18	○	○	○	○	○	○	○	○
実施例11	26	○	○	○	○	○	○	○	○
実施例12	31	○	○	○	○	○	○	○	○
実施例13	35	○	○	○	○	○	○	○	○
実施例14	39	○	○	○	○	○	○	○	○

○：クラックなし、結晶化なし    ×：クラックあり、結晶化あり

[Table 15]

	例示化合物	初期特性			転写メモリ $V_{d1} - V_{d2}$ (V)
		$V_0$ (-V)	$V_1$ (-V)	$E_{1/5}$ (lux·sec)	
比較例4	D	705	685	1.05	35
比較例5	E	690	680	0.95	25
比較例6	F	690	665	0.72	20

[Table 16]

	例示 化合物	感光層のクラック				電荷輸送物質の結晶化			
		1 H	2 H	4 H	8 H	1 日	3 日	5 日	7 日
比較例 4	D	○	○	×	—	○	○	○	×
比較例 5	E	○	○	○	×	○	○	×	—
比較例 6	F	○	○	×	—	○	×	—	—

○ : クラックなし、結晶化なし    × : クラックあり、結晶化あり

[0051] Embodiment 154-. 5 g of (4-dimethylamino phenol)-2 and 6-diphenyl CHIPIRIRIUMU park rate of 4.6 g and said illustration compound 3 is mixed in the toluene (50 weight sections)-dioxane (50 weight sections) solution 100g of copolymerized polyester resin (weight average molecular weight 44,000), It distributed by the ball mill for 26 hours. Applied these dispersion liquid by Mai Ya Bar on the aluminium sheet, it was made to dry at 120 \*\* for 1 hour, the photosensitive layer of 13 micrometers of film thickness was formed, and the electro photography photo conductor was created. The initial characteristic of the created electro photography photo conductor was measured by the same method as Embodiment 1. A result is shown.  $V_0 = -705V$ ,  $V_1 = -695V$ , and  $E_{1/5} = -3.9 \text{ Lux-sec}$  again, When the crack of a photosensitive layer and the promotion examination of crystallization of an electric charge transportation substance were done in a similar manner like Embodiment 1, about the crack, 8 hours after was not accepted at all, and it accepted at all in not a week also about crystallization.

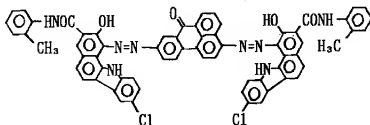
[0052] The lower influence layer whose film thickness after an application and dryness is 1.5 micrometers about the 35% methanol solution of alcoholic soluble nylon (6-66-610-12 4 yuan nylon copolymer) was formed on the embodiment 16 aluminum base material.

[0053] Next, 9 g and 9 g of bisphenol A type polycarbonate resin (weight average molecular weight 30,000) of the illustration compound 39 are dissolved in the mono-chlorobenzene (60

weight sections)-dichloromethane (20 weight sections) solution 82g, The electric charge transportation layer whose film thickness after an application and dryness is 19 micrometers for Mai Ya Bar on a lower influence layer about this liquid was formed.

[0054]Next, the paints 4g which have the following structural formula

[Chemical formula 11]



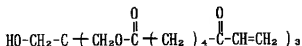
2.5 g of butyral resin (degree % of 65 mol of butyral-izing) was distributed by SANDOMIRU in 65 ml of tetrahydro francs. The charge generating layer whose film thickness after an application and dryness is 0.8 micrometer for Mai Ya Bar on an electric charge transportation layer about these dispersion liquid was formed, and the electro photography photo conductor was created. The electrophotographic properties of the created electro photography photo conductor were measured by the same method as Embodiment 1 (however, electrification plus electrification). A result is shown.  $V_0 = +700V$ ,  $V_1 = +695V$ ,  $E_{1/5} = 2.3 \text{ Lux-sec}$

[0055]On an embodiment 17 glass base material, 8 g of alcoholic soluble copolymerization nylon resin (weight average molecular weight 26,000) of N-methoxymethyl-ized 6 nylon resin (weight average molecular weight 28,000) The methanol 30g, The lower influence layer whose film thickness after an immersion application and dryness is 1 micrometer about the liquid which dissolved in the mixed solution of the butanol 70g was formed.

[0056]Next, 11 g and 11 g of bisphenol A type polycarbonate resin (weight average molecular weight 29,000) of the illustration compound 14 are dissolved in the mono-chlorobenzene (40 weight sections)-dichloromethane (60 weight sections) solution 100g, The electric charge transportation layer whose film thickness after an application and dryness is 18 micrometers for Mai Ya Bar on a lower influence layer about this liquid was formed.

[0057] Next, 65 g of acrylic monomers which have the following structural formula,

[Chemical formula 12]



Distribution was performed for 2.5 g of 2-methyl thioxan tons, and 280 g of methyl cellosolve by SANDOMIRU for 79 hours as the tin oxide ultrafine particle 35g whose average particle diameter before distribution is 400 Å, and a photoinitiator. After forming the film by beam coating on the photosensitive layer and drying these dispersion liquid, the high-pressure mercury lamp performed optical hardening for 60 seconds with the light intensity of 8 mW/cm<sup>2</sup>, and a 2.5-micrometer protection layer was formed. Thus, although it observed under the penetrated type microscope to the obtained photosensitive layer, putting light in the angle of 15 degrees from the back, crystallization of the crack of a photosensitive layer and the electric charge transportation substance had not taken place.

[0058]

[Effect of the Invention]The electro photography photo conductor of this invention is high sensitivity.

On the occasion of the continuation image formation by repetition electrification and exposure, change of bright section potential and dark part potential is small excellent in endurance. Also in a reversal development system, a transfer memory generates the prominent effect that it is very small and the crack of a photosensitive layer and crystallization of an electric charge transportation substance hardly take place. The effect which equipped the process cartridge and the electrophotography device and was excellent similarly is generated.

[Brief Description of the Drawings]

[Drawing 1]The figure showing the outline composition of the electrophotography device which

has a process cartridge which has an electro photography photo conductor of this invention.

[Explanations of letters or numerals] 1 Electro photography photo conductor [ Developing means 6 / Transfer means 7 / Transfer material 8 / Image fixing means 9 cleaning means 10 / Pre-exposure light 11 / Process cartridge 12 / Rail ] 2 of this invention Axis 3 Primary electrifying means 4 Picture exposure light 5

---

[Translation done.]